Project for Decommissioning the Former Pyrocel Factory Site in Louiseville

Comprehensive Study Report Summary

Public Works and Government Services Canada

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1 SYNOPSIS

The present document constitute the summary report for the comprehensive study completed under Public Works and Governmental Services Canada's (PWGSC) supervision and based on the *Canadian Environmental Assessment Act* (CEAA) for the decommissioning of the old Pyrocel Plant in Louiseville, Quebec. This document and its appendices are placed at the disposal of the local population, by the Canadian Environmental Assessment Agency (CEAA), to obtain comments from the public.

As a whole, the report includes the project's environmental assessment. This old plant produced and recycled car batteries up to 1986. The property and the building are contaminated with lead, total sulfur and phenolic compounds. Restoration work could begin as soon as Spring 2002. Considering the mitigation measures proposed, it is PWGSC point of view that the project, as presented in the comprehensive study, is not likely to cause important negative environmental impacts. However, it must be noted that this is only a preliminary conclusion, which will be reconsidered following the analysis of the comments received during the public consultation phase and following the announcement of the Environment minister's decision.

2 INTRODUCTION

2.1 PROJECT OVERVIEW

The Pyrocel site is located at 851 boulevard Saint-Laurent in Louiseville, Québec. The factory, which was built in 1963, manufactured and recycled automobile batteries until 1986. It was officially declared bankrupt in 1991, and following a decision by Justice Canada in 2001, the management of the land and the building were transferred to PWGSC. PWGSC has already proceeded with the disposal of all the liquid hazardous wastes present on the site through a specialized company, and has completed the site and building's characterization. The vacant site (the land and building) of the former Pyrocel factory is contaminated with lead, total sulphur and phenolic compounds. The building is in an appreciable state of dilapidation and is a significant safety hazard.

In response to this situation, PWGSC set itself the priority of decommissioning the former Pyrocel site. A preliminary activity, composed of cleaning and securing this site, could be completed by March 2002. The decommissioning project proper could then be undertaken. The project comprises three phases that primarily involve the demolition of the building (including materials management), the characterization of the soils under the concrete floor of the building after demolition, and the excavation and management of the contaminated soils (including replacement by "clean" fill). All these activities could be completed by the beginning of fall 2002. The restored site will meet the requirements for residential use.

2.2 PURPOSE OF THE PROJECT

The project for decommissioning the former Pyrocel factory site is consistent with the goals of sustainable development.

It should be remembered that the site is situated in a strategic location in the City of Louiseville: on boulevard St-Laurent (Highway 138). There is no land available in this part

of the town, since all other available land is situated in an agricultural zone. Furthermore, the residential neighbourhood is affected negatively by the presence of the dilapidated factory building in terms of aesthetics, safety and nuisance (birds etc.). The City of Louiseville has a lot to gain from the restoration of the site, which has great redevelopment potential. Moreover, the people of the City would also benefit from the resulting improvement in the quality of the environment.

2.3 NEED FOR THE PROJECT

The project for decommissioning the former Pyrocel factory site has received the support of the City of Louiseville. The facts related above show briefly the heavy legacy the municipality has inherited over the last decade due to the presence of a contaminated "orphan" site for which PWGSC recently assumed responsibility. Besides the municipality and its citizens, the Quebec environment ministry, MENV, has also demonstrated its concern for the physical environment of the site, and in 1995, carried out a soil characterization (MEF, 1995). In 1996, the Mauricie-Bois-Francs Regional Health and Social Services Board (RRSSS) issued a statement concerning the health risks for neighbouring residents. Fortunately, no serious risk was identified. In 2001, the federal government's assumption of responsibility for the site was received as good news, and the public expects this project to be completed.

2.4 TIMING CONSIDERATIONS

As mentioned above, the Pyrocel file has been dragging on for over 10 years. After the bankruptcy of the factory's owner, MENV attempted unsuccessfully to assign responsibility for the site and the contamination. The municipality of Louiseville inherited and assumed responsibility for the management of the site until Justice Canada reevaluated the chain of ownership and determined, in February 2001, that the Government of Canada is the owner. Management of the property was then transferred to PWGSC. In addition to contamination by lead, total sulphur and phenolic compounds on the site, the building poses

risks to public safety (structural instability, presence of birds, breaking and entry raising fears of fire, etc.). All the activities forming part of the project for decommissioning the former Pyrocel factory site must be initiated as soon as possible. The preliminary activity, which consists of cleaning and securing this site, is urgent. This schedule foresees project start-up at the beginning of March 2002, and if respected, all the work could be carried out in a period when weather conditions are most suitable (particularly from the standpoint of inconvenience to the population) and would avoid one or several parts of the project being postponed until 2003.

2.5 REGULATORY, POLICY AND PLANNING CONTEXT

Since the site of the former Pyrocel factory became the property of the federal government, The *Canadian Environmental Assessment Act* (CEAA) applies. The *Comprehensive Study List Regulations* designate the projects and categories of projects for which a comprehensive environmental study is compulsory.

The project for decommissioning the former Pyrocel factory site in Louisville is therefore subject to the federal environmental assessment process since it forms part of the designated projects and PWGSC is the responsible authority. Accordingly, the responsible authority must submit a comprehensive study report to the Canadian Environmental Assessment Agency (CEAA) in order to solicit comments from the public. Once the comments by the public and other concerned parties and the information contained in the comprehensive study report and other documents presented by the responsible authority have been taken into consideration, the CEAA will make recommendations to Environment Canada concerning the measures to be taken. The Minister will make a decision regarding the next step in the environmental assessment process in the light of the comprehensive study reports and the comments received relative to these reports. It is at this step that the Minister can proceed to mediation or to an assessment by a commission if major negative environmental effects are identified or if the concerns expressed by the public so justify.

It should be noted that, since ownership is federal, it is not subject to the requirements of Québec's *Loi sur la qualité de l'environnement.* However, acting as a good corporate

citizen, the federal government has had discussions with MENV, and has taken into consideration the province of Quebec's standards for this type of project.

Furthermore, the option to dispose of the excavated contaminated soil in Québec will be carried out in compliance with the Québec government's regulations respecting the burial of contaminated soils (*Règlement sur l'enfouissement des sols contaminés*).

3 PROJECT DESCRIPTION

3.1 CONTEXT

The project comprises the demolition of the building (including the management of materials), the characterization of the soil under the concrete floor of the building following demolition, and the excavation and management of the contaminated soil (including replacement by "clean" fill).

3.2 DESCRIPTION OF THE SITE

The industrial property targeted by the project corresponds to the land of the former Pyrocel factory, with the exception of a part ceded by auction to the municipality (for tax arrears). The former factory is located at 851 boulevard Saint-Laurent in Louiseville, Québec.

The land is more or less rectangular in shape and covers an area of close to 14,300 sq. metres. The east and south sides are almost entirely fenced off, whereas the north and west sides are only partially fenced off. The north and west fences demarcate a back yard and join up with the building at the southwest and northeast corners. The land at the front and on the northeast side of the building is accessible, but the building is completely boarded up with panels of nailed plywood.

The site is criss-crossed with various underground infrastructures, including a natural gas line that begins on boulevard Saint-Laurent and follows the northeast side of the building up to an entry in the building located close to the northeast corner. A storm drain originating in from the west extends along the northern limit of the site. It branches off towards the interior of the back yard and meets up with a sewer manhole in the centre of the yard. An underground telephone line runs along the eastern limit of the site, as well as a small stretch of the north and south limits. A sanitary sewer line and a water supply line in parallel link the rear of the building to the municipal system located on Cloutier Street. Finally, there is a Bell Canada utility line that runs along the southern limit of the site.

The back yard is mostly covered by weed-covered wasteland and a few trees. There is also a small wooded area on the southwestern part of the site. A small depression can also be seen where water accumulates and stagnates, as can be testified by the presence of semi-aquatic plants (bullrushes and other herbacious plants). A variety of debris, equipment and material originating in the building lies on the ground. There are also empty barrels, concrete flagstones and pillars, three old metal tanks, and various pieces of metal and wood as well as branches and tree trunks cut up and piled into a heap. We should also mention that there are three observation wells arranged in a triangle in the back yard.

The building almost entirely occupies the western half of the site. It is a one-storey building of wood and steel structure on a concrete base. The walls are made of concrete blocks covered by cement parging and brick. However, a recent addition to the southeastern corner of the building has steel siding. The whole roof of the building is flat and, except for the recent addition, is made entirely of wood covered with tar and stone. The roof of the new section is of steel.

3.3 TECHNICAL PROCEDURES

The decommissioning of this industrial property requires the implementation of various technical procedures divided into three major intervention phases to be preceded by a preliminary activity that should be completed quickly.

The preliminary activity consists of cleaning the interior surfaces of the accessible parts of the building. In fact, Pyrocel's activities generated lead dust that was deposited and became encrusted on the building's walls, ceilings and floors.

In order to remedy this problem, it was decided to proceed with the cleaning of the interior surface of the building in order to reduce the level of concentration on various surfaces and therefore permit the elimination of refuse such as solid wastes or dry materials. This involves removing a superficial layer (the method to be determined by the contractor) of concrete flooring, using industrial vacuum cleaners to pick up the dust, and the complete cleaning of other surfaces by an appropriate method (e.g. may be carried out by an

industrial vacuum cleaner fitted with HEPA filters). The choice of the method used will be left to the selected contractor, but the environmental standard to be considered will be established by PWGSC in concordance with the existing legislation.

It should be noted that this work cannot be carried out throughout the building, since certain sections suffered major damage following the collapse of part of the roof. All of the waste products generated by the demolition of these sections will be followed and managed according to the appropriate legislation and to their level of contamination.

Phase A of this project corresponds to both the demolition of the building and the elimination of the resulting material. The already partially collapsed sections will be demolished first, and the resulting materials will be characterized and disposed of according to their level of contamination. The other sections will then be demolished and the resulting materials disposed of according to their level of residual contamination. Water will be sprayed to reduce the dust levels. The anticipated management modes are as follows:

- Hazardous materials, including pigeon droppings (approx. 150 m^3) will be sent to a hazardous material transfer centre that will redirect the material to an authorized site, e.g., the Onyx Industries site in Trois-Rivières.

- Special wastes (approx. 40 m^3): permanent repository in a safe authorized burial site, e.g. the Horizon Environment site in Grandes-Piles or the Cintec Environnement site in LaSalle.

- Dry materials (volume, estimated at 5 200 metric tons of dry material and solid waste): final repository in a dry materials disposal site, e.g., the Services Matrec site in Trois-Rivières.

- Solid Waste (volume, estimated at 5 200 metric tons of dry material and solid waste to be determined during the demolition phase): final repository in sanitary landfill site, e.g. the Saint-Étienne-des-Grès site.

- Wastewater (if required, volume undetermined, will depend on the approach chosen for the cleaning): wastewater will be pumped by a vacuum truck during the cleaning; if the

water is contaminated above the effluent discharge standard of the City of Louiseville, it will be manage by a specialized firm, e.g. Onyx Industries in Trois-Rivières or Services Matrec, also in Trois-Rivières.

Phase B of the project consists of carrying out the characterization of the soil situated under the concrete floor of the building following its removal. These soils were not characterized during previous studies. The characterization techniques applied to them will comply with federal guidelines and guides, in particular, the *Canadian Soil Quality Guidelines for Contaminated Soils: Human Health Effects* (CCME), and provincial guides, such as the MENV Policy (1999, revised in 2000 and 2001).

The third and final phase of the project, phase C, involves both the excavation of contaminated soils and their elimination through the sites authorized to receive them. The excavation will then be filled with "clean" fill that will be compacted and levelled off to the same level as the natural horizon. At the end of the work, the site will be ready to be reused. With regard to the RESC and the contaminated soils management grid of the MENV, the anticipated management modes are as follows:

- Soils above the limits presented in the Appendix 1 of the *Règlement sur l'enfouissement des sols contaminés* (1,312 metric tons – 5,000 mg/kg and over): elimination at the Stablex Canada site at Blainville. This option has been considered with the MENV and it has been accepted. If other proven and economically sound technologies were to be identified at this stage, they would be considered for the realization of this last stage as long as the work schedule could be respected;
- Soils C+ but below the limits presented in the Appendix 1 of the *Règlement sur l'enfouissement des sols contaminés* (324 metric tons – 1,000 to 5,000 mg/kg): permanent repository in a safe, authorized burial site e.g. Horizon Environnement in Grandes-Piles or Cintec Environment in LaSalle
- Soils B-C (788 metric tons - 500 to 1,000 mg/kg): utilization as ordinary covering materials in a sanitary landfill site; Services sanitaires RS site in Berthierville or the BFI site in Lachenaie.

- Soils A-B (997 metric tons - 140 to 500 mg/kg): utilization as ordinary or final covering materials in a sanitary landfill site; Services sanitaires RS site in Berthierville or the BFI site in Lachenaie.

3.4 IMPLEMENTATION AND SCHEDULE

The implementation of this project has already been begun with this comprehensive study, and it must be completed with the help of the comments received in order to finalize the rest of the foreseen interventions.

PWGSC intends to initiate, as rapidly as possible, the preliminary activity that consists of decontaminating all the accessible interior surfaces in the building. The objective is to begin and complete this activity before the beginning of spring, even before the end of April 2002. In fact, the dilapidated state of the building, which poses a risk to health and safety, combined with the fact that intruders have been seen on the property on several occasions, calls for rapid action in order to resolve the various problems related to the site. Furthermore, initiating the work before the spring would make it possible to carry out some of the project activities in more favourable weather conditions and to avoid postponing all or part of the project until 2003.

In this way, the demolition of the building could be completed by the beginning of June, and the final characterization and work under the concrete floor completed by mid-June. It would be possible to complete the decontamination and restoration work at the site during the summer of 2002.

4 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

Three private enterprises and one public agency have been approached to help determine ways of carrying out the decontamination work in the building of the former Pyrocel factory. A comparative table of the various methods is provided below.

Table 4-1: Comparison of Methods

Cleaning phase	Method	Principle	Advantage (A) and Disadvantage (D)	Effect on the environment
Cleaning pigeon droppings	1.Moistening	• Use of a spray to moisten droppings in order to avoid generation of dust likely to contain infectious agents. • The moistened droppings are then picked up with a shovel or a scraper and put into bags.	• (A): Method recognized by the RRSSS. • (A): Less costly method than 2.	• Negligible
	2. Suction	• Use of an industrial vacuum cleaner fitted with HEPA filters to collect droppings. • If the droppings are found in a pile, moistening will be necessary as vacuuming must be coupled with picking up with a shovel or scraper.	• (A): Method recognized by the RRSSS. • (D): More costly method than 1.	• Potential for generation of dust likely to contain infectious agents.
Cleaning concrete floor	1.Scarifiying	• Use of a scarifyer for removing a predetermined layer of concrete. • Moistening by using a spray in order to avoid generating dust.	• (A): Precise method. • (A): Smooth surface permits better collection of residues. • (A): Generation of noise less than with use of pneumatic hammer. • (A): Less costly method than 2. • (D): Method may generate dust.	• Potential for generating dust likely to contain lead. • Generation of noise.

Table 4-1: Comparison of Methods (cont'd)

Cleaning Phase	Method	Principle	Advantage (A) and Disadvantage (D)	Effect on the environment
	2.Crushing	• Use of a pneumatic hammer to remove a layer of concrete.	• (D): Imprecise method. • (D): Irregular surface makes it difficult to collect residues. • (D): Method may generate dust. • (D): Generation of noise in the order of 120 dB(A). • (D): More costly method than 1.	• Potential for generating dust likely to contain lead. • Generation of noise.
Cleaning materials	1.Water spray	• Utilisation of a high-pressure jet of water with a substance added to help dislodge the contamination. • Pumping the water generated with a vacuum truck	• (A): Rapid method. • (D): More costly method than 2. • (D): Generation of water (i.e. in the order of 3 gals./min. during use) needing to be managed.	• Generation of 3 gal./min. of potentially contaminated water.
	2.Suction	• Use of an industrial vacuum cleaner fitted with HEPA filters. • If the contamination is difficult to dislodge, moistening will be necessary since vacuuming must be combined with manual removal.	• (A): Generation of a minimum of residues. • (A): More costly method than 1 and 3. • (D): Less rapid, particularly with manual cleaning.	• Potential for generation of dust likely to contain lead.
	3.Dry ice	• Use of a dry ice spray. • Use of a vacuum cleaner fitted with HEPA filters for collecting residues.	• (A): Generation of a minimum of residues. • (D): 2 to 3 times more costly than methods 2 and 3. • (D): Generation of CO_2.	• Generation of greenhouse gas. • Liberation of contaminants in the air due to the action of the air jet.

As for the pigeon droppings, there do not seem to be many alternatives. The RHSSB approach should be followed during implementation of the work.

As for cleaning up porous materials, although the pneumatic hammer generates less dust and it is less expensive to use, the bush hammer is recommended because of the surfaces involved and the degree of control offered by the equipment, thereby producing a reduced volume of materials to be managed.

Finally, the option of using dry ice as a cleaning agent was not selected owing to the anticipated costs and the impact of liberated CO_2. The production of potentially contaminated water is a disadvantage of the water based method in comparison to the vacuum method, because wastewater would may have to be recuperated and treated.

Two alternative project solutions could be envisaged:

- Reusing the building
- Non-intervention.

Reusing the Building

Reusing the building would necessitate decontaminating it in order to make it safe for the health of the future occupants. Various studies (Progestech, 1998; Sanexen, 2001b; Sanexen, 2000c) have shown the presence of contaminants to which future occupants might be exposed.

The Pyrocel factory building has been abandoned for a decade, with no maintenance. In certain places, the outside walls show numerous cracks and substantial bulging. Furthermore, a portion of the building's roof collapsed in 2001. The building represents risks with regard to safety and structural stability.

Reusing the building is therefore not an option, since the integrity of the building was affected by being abandoned more than ten years ago and a subsequent lack of maintenance.

Non-Intervention

The federal government has developed an approach towards contaminated sites (GTGLC, 2000) aimed at sites under federal jurisdiction. This approach is primarily centred on principles of sustainable development and pollution prevention. The approach recommends the development and implementation of a cleaning strategy. The approach could be applied to the former Pyrocel factory site.

In the present context, taking into account the media interest in the site, non-intervention is not an option.

5 SCOPE OF THE ASSESSMENT

5.1 SCOPE OF THE PROJECT

It has been determined that the project comprises the preliminary activity composed of the cleaning and securing of the sites and the three phases involving the demolition of the building (including the management of the materials), the characterization of the soil under the concrete floor of the building following demolition, and the excavation and management of contaminated soils (including replacement by a "clean" fill).

5.2 FACTORS TO BE CONSIDERED

CEEA has established a list of factors to be considered in carrying out the comprehensive study. These factors are as follows:

- Environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects.
- The significance of the effects.
- Public comments.
- Mitigation measures.
- Purpose of the project.
- Alternative means for carrying out the project.
- The need for and requirements of any follow-up program.
- Sustainability of renewal resources.
- The need for the project and alternative solutions.

5.3 SCOPE OF FACTORS

The scope of the factors consists of defining the environmental level of the assessment. It involves identifying the components that the environmental assessment must focus in the case of the project to be carried out.

The primary components of the environment selected within the context of the environmental assessment of the project for decommissioning the former Pyrocel factory site are as follows:

- Geology (nature, thickness, permeability)
- Hydrology (watercourses and watersheds, drainage of the site)
- Hydrogeology (direction of runoff)
- Meteorology (winds)
- Ambient noise
- Protected or valued fauna or flora
- Flora
- Fauna
- The makeup of the urban environment (soil use, zoning, ambient noise, heritage factors)
- Infrastructure (road, rail and air transport, energy transport, recreational/tourist infrastructures)
- Characteristics of the soils and materials on the site and of the former factory bulding.

It should be noted that there is no current traditional use of the land and resources aboriginal people in this study zone. Furthermore, Mr. Jean-Jacques of the Louiseville History Society was contacted in order to verify the potential presence of heritage elements in the immediate sector of the property under study. It appears that no elements of this type are present.

6 PUBLIC CONSULTATION PROGRAM

6.1 GOVERNMENT CONSULTATION

For the drafting of the final version of the comprehensive study report, PWGSC has consulted two departments (expert federal authorities) besides CEAA likely to be interested in the project for decommissioning the former Pyrocel factory site. These are Environment Canada and Health Canada .

It should be noted that PWGSC participates in discussions with MENV and that the latter's concerns are integrated into the environmental assessment process. There is also regular dialogue with representatives of the city of Louiseville.

6.2 PUBLIC COMMENT

At the stage of the provisional version, public comments have not yet been collected. However PWGSC has already recorded the project in the public registry, which is one of the components of the public information program. PWGSC also keeps a public registry, which allows the environmental assessment documents to be made available to the public.

CEAA also has a role to play, particularly in the publication of public notices, the dissemination of the comprehensive study reports, the holding of public consultation and the reception and analysis of public comments. Therefore, when the comprehensive study report is submitted to the Minister of the Environment and the CEAA, the latter will make the comprehensive study reports available to the population of the Louiseville region for a thirty-day consultation period. The public will then have an opportunity of communicating their comments on the project and the comprehensive study report.

To this can be added a public consultation by the city of Louiseville in collaboration with PWGSC. To this end, a public notice was published on Feb. 3, 2002 in the *Echo* newspaper, inviting the public, i.e. the citizens of Louiseville, to communicate their concerns with regard to the project to a representative of PWGSC. These comments will be analyzed and integrated within the official version of the comprehensive study report. No comments were received following this activity.

7 DESCRIPTION OF THE EXISTING ENVIRONMENT

The industrial property of the former Pyrocel factory is situated in a low-density urban community whose municipal limits are tightly surrounded by farming operations.

7.1 PHYSICAL ENVIRONMENT

7.1.1 Geology

Three test drillings carried out in the back yard of the property under study by the firm Sanexen (2001a) as part of the environmental characterization of the site achieved a maximum depth of three meters. In every case, the stratigraphy showed the presence of an upper layer of landfill of a thickness varying between 30 to 75 cm. This first layer was followed by a soft greenish-grey clay that extended to the limit of the drilling.

Topographically, the site under study is composed of generally flat terrain.

7.1.2 Hydrology

The Petit Bois watercourse joins the Petite Rivière du Loup about 500 meters south of the site under study. The sectors surrounding the site are all connected to storm drains, which handle the local surface waters.

7.1.3 Hydrogeology

Water level readings taken by the firm Sanexen (2001a) on the site under study during soil characterization, show a water flow in the back yard that appears to tend toward the building, i.e. towards the northwest. This phenomenon can be explained by the presence of underground infrastructures on the site, which might influence the flow of local underground waters. In fact, there is a manhole connected to a storm drain in the sector where the underground waters are deepest. It seems, therefore, that this sump influences the local flow of the underground waters, which move towards this preferential flow point. It is

however important to note that the groundwater flows into a low to non permeable area (clay).

7.1.4 Meteorology

Within the context of this project, the most significant meteorological factor is the average direction of prevailing winds. Indeed, one of the principal environmental effects of this project could consist of dust emissions. It is thus important to know the direction of the dominant winds to make it possible to determine which sectors peripheral to the site are most likely to receive dust. According to a spokesperson at the Louiseville airport, annual average prevailing winds originate from the west. In winter, there is a prevalence of winds from the northwest, whereas in summer, it is the southwest winds that prevail.

7.1.5 Ambient Noise

The local sound environment is a significant factor in the intervention Environment of the former Pyrocel factory site decommissioning project. The former factory site forms part of a quiet residential sector in which the primary source of noise is from motorized traffic on boulevard Saint-Laurent.

7.2 BIOLOGICAL ENVIRONMENT

7.2.1 Protected and/or Valued Sectors

Protected and/or valued sectors include not only the spaces protected by law but also those sectors to which the local population attaches high importance. At the regional level, there is the Lake Saint-Pierre Priority Intervention Zone (PIZ), which has its committee offices in Louiseville. The project should not affect this PIZ, considering the distance between that site and this, and there are no other sectors with special protection status in the region.

7.2.2 Flora

The site under study is thus in a sector where the existing flora are a result of the intensive transformation of the territory through human activity. On the site under study, there is one

one dominant species of tree, the trembling aspen (*Populus tremuloides*). There are two or three specimens of this tree in the backyard with two specimens of white birch (*Betula papyrifera*) on the eastern side of the building. An area of approximately 20 to 25 m^2 situated on the southwest part of the land is completely covered with shrubs and small trees of the aspen variety forming a relatively dense wooded area. Apart from the large specimens that are at least 15 to 20 years old, all the other specimens probably appeared shortly before or after the end of activities on the site, i.e. in 1986.

7.2.3 Fauna

The habitats represented by the linden bush and the wet zones of the shores of Lake St. Pierre are generally well-suited to the growth of a wide variety of animal species. However, the urban development of Louiseville, the major farming activity on neighbouring land and the fragmentation of what remains of the old forest and small backyard woods has significantly reduced the diversity of species to be found in the sector. The only fauna possibly present are those common to this type of Environment.

7.3 SOCIAL ENVIRONMENT

7.3.1 Components of the Urban Environment

The project concerns the area within the limits of the city of Louiseville. Figure 7-1 clearly illustrates the nature of the land use around the property under study. As can be seen, single-family residential sectors are located mainly on the eastern and southern sides, but also towards the northeast. Towards the north, there is a small commercial zone (retail outlets) and a wide corridor made up of boulevard Saint-Laurent and the Canadian Pacific railway. To the north of this corridor are vacant lots zoned for single-family residential development, as well as existing residential areas.

Figure 7-1: Land Use in the Periphery of the Site Under Study

7.3.2 Infrastructures

The infrastructures linked directly to the site under study include both above-ground and underground facilities. The above-ground facilities are composed of the local road network including boulevard Saint-Laurent, which provides access to the site, and of three other streets that surround the site: Saint-Germain, Cloutier and Bel Essor streets.

Other above-ground facilities include the electricity transmission lines on wooden poles that can be seen in the back lots of the residential properties forming the northern, eastern and southern limits of the site under study. It is possible that the cable television network and part of the local telephone network are also installed on these wooden poles. The major part of the site is encircled by a 6-foot chain-link fence, that is to say, covering over one third of the northern limit, all of the eastern limit, all of the southern limit and approximately one third of the western limit.

The underground system includes a network of water, sanitary sewer, storm-water sewer and natural gas lines.

7.4 GROUNDS AND BUILDING OF THE FORMER FACTORY

Various characterizations of dismantling materials were carried out in the building, including those by Sanexen (2001b; 200c). The results relating to waste and porous refuse indicate the presence of hazardous waste and special waste.

Various environmental characterizations were also carried out on the site under study. In 1995, MENV (MEF, 1995) carried out a soil characterization by analyzing lead on the surface and up to a depth of 0.15 meters. In total, there were 56 sampling stations and 69 samples were analyzed. Of this number, 45 samples exceeded generic criterion C. This study was followed in 1998 by that of Progestech, in which 10 samples were analyzed in 6 sampling stations. Six of these samples exceeded generic criterion C. Finally, Sanexen (2001a) completed the soil characterization by carrying out 14 exploration trenches and 3 drillings equipped with an observation well. A level of contamination higher than generic

criterion C in total sulphur or lead was observed in 11 of the 31 samples analyzed. Moreover, 6 of the 8 samples rated C+ in lead were found beyond Appendix 1 of the Québec government's *Règlement sur l'enfouissement des sols contaminés* (RESC). The estimate provided by Sanexen (2001a) indicated the presence of approximately 910 m^3 and 190 m^3 of C+ soils in lead and total sulphur, respectively. In the case of lead, the majority of the samples of C+ soils exceeded RESC standards listed in Appendix 1of this regulation.

The underground water sampled in 3 observation wells installed on the ground respected the quality standards for surface and sewer water.

8 PREDICTED ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

For details on the methodology used for evaluating the effects on the environment of the former Pyrocel factory site decommissioning project, the reader is asked to refer to the document in the appendix of the comprehensive study report.

8.1 ENVIRONMENTAL ASSESSMENT RELATED TO THE PRELIMINARY ACTIVITY

The summary of the effects on the environment presented in table 8-1 makes it possible to see that the preliminary activity in the former Pyrocel factory decommissioning project will have only insignificant negative effects. Almost all these negative effects can, by means of the mitigation measures described previously, have their impact reduced to negligible (residual negative effects). All mitigation measures used to reduce the importance of the negative effects of the project are found in the comprehensive study. These measures focus on soil quality, surface and groundwater, air quality, noise levels, local roads, aboveground and underground services as well as health and safety. All the negative effects are short-lived or temporary except for those capable of affecting the health of workers, in which case the consequences are potentially permanent. Moreover, the final result of this preliminary activity has residual effects of positive importance for the health and the safety of the population due to the decontamination of the building's accessible spaces.

Table 8-1: Summary of the Analysis of the Anticipated Environmental Effects of the Decommissioning of the Former Pyrocel Factory Site/Preliminary Activity

Source of effect		Effect			Environ. value	Degree of perturb.	Intensity effect	Duration/ effect	Duration/ intensity index	Extent of effect	Importance of effect	Mitigation measures. (See list in appendix 6)	Residual effect (importance)
Step	**Activity**	**Environ-ment**	**Environmental factor**	**Description**									
Prelim-inary	Installation of site	Human	Services	Interruption in energy, telephone and water distribution services by the works	High	High	High	Short	Medium	Limited	Not important	16, 17, 18	Negligible
	Removal of pigeon droppings	Physical	Air quality	Release into the air in working areas of dust possibly containing infectious agents	High	High	High	Temporary	High	Limited	Not important	6, 7, 8, 10	Negligible
		Human	Health and safety	Possible exposure of workers and neighbouring residents to infectious agents	Very high	High	High	Temporary to permanent	High	Limited	Not important	6, 7, 8, 10, 19, 20, 23, 24	Not important to negligible
	Cleaning and evacuating debris	Physical	Soil quality	Storage of contaminated materials on the ground could result in contamination	High	Medium	High	Temporary	High	Limited	Not important	2, 3, 9, 27	Negligible
			Quality of surface water and groundwater	Precipitation could wash some of the contaminants into the soil and they could filter into the water table	Average	Low	Low	Temporary	Low	Limited	Not important	2, 9	Negligible
			Air quality	Handling debris in the building poses a threat to inside air quality because of the dust accumulated on it	High	Medium	High	Short	Medium	Limited	Not important	6, 7, 8, 9, 10	Negligible
		Human	Health and safety	Risk of health problems to workers exposed to the dust	Very high	Medium	High	Temporary to permanent	High	Limited	Not important	6, 7, 8, 9, 10, 19, 20, 23, 24	Not important to negligible
	Cleaning of concrete floors	Physical	Air quality	Cleaning the floors risks generating large quantities of dust that may modify the air quality inside and outside the building	High	High	High	Temporary	High	Limited	Not important	6, 7, 8, 10	Negligible
			Ambient noise	Cleaning the floors may be responsible for a significant increase in local noise levels	High	Medium to high	High	Temporary	High	Limited	Not important	11, 12, 13	Not important

Table 8-1: Summary of the Analysis of the Anticipated Environmental Effects of the Decommissioning of the Former Pyrocel Factory Site/Preliminary Activity (cont'd)

Source of effect		Effect			Environ. value	Degree of perturb.	Intensity/ effect	Duration/ effect	Duration/ intensity index	Extent of effect	Importance of effect	Mitigation measures. (See list in appendix 6)	Residual effect (importance)
Step	Activity	Environ-ment	Environmental factor	Description									
		Human	Health and safety	This activity will generate dust that will represent a risk for health of workers	Very high	High	High	Temporary to permanent	High	Limited	Not important	6, 7, 8, 10, 19, 20, 23, 24	Not important to negligible
	Removing dust	Physical	Air quality	This activity risks generating large quantities of dust that could modify the air quality inside and outside the building	High	Medium	High	Temporary	High	Limited	Not important	6, 7, 8, 10	Negligible
		Human	Health and safety	Exposing workers to dust could have a harmful effect on their health	Very high	High	High	Temporary to permanent	High	Limited	Not important	6, 7, 8, 10, 19, 20, 23, 24	Not important to negligible
	Cleaning interior surfaces of the building	Physical	Quality of surface and underground water	Water generated by the work could contaminate surface water and groundwater	Average	High	Average	Temporary	Medium	Limited	Not important	5	Negligible
			Air quality	This activity risks generating large quantities of dust and water vapour that could modify the air quality inside and outside the building	High	High	High	Temporary	High	Limited	Not important	6, 7, 8, 10	Negligible
		Human	Health and safety	Exposing workers to dust and water vapour could have a harmful effect on their health	Very high	High	High	Temporary to permanent	High	Limited	Not important	6, 7, 8, 10, 19, 20, 23, 24	Not important to negligible
	Regular cleaning of the roof	Human	Health and safety	Clearing snow from the roof of a building with structural weaknesses represents a risk to the safety of workers	Very high	High	High	Temporary to permanent	High	Limited	Not important	20, 25, 26	Not important to negligible
	Dismantling the work site	Human	Services	Interruption of energy, telephone and water distribution services due to the dismantling of the work site	High	High	High	Short	Medium	Limited	Not important	16, 17, 18	Negligible

8.2 ENVIRONMENTAL ASSESSMENT RELATED TO PHASES A, B AND C

The summary of the effects on the environment presented in table 8-2 makes it possible to conclude that the actual decommissioning project (phases A, B and C) of the old Pyrocel factory site will have only insignificant negative effects. Almost all these negative effects can, by means of the mitigation measures described previously, have their importance reduced to negligible (residual negative effects). All mitigation measures used to reduce the importance of the negative effects of the project are found in the comprehensive study. These measures focus on the surface and quality of soils, surface and groundwater, air quality, noise levels, vegetation and habitats, built areas, local roads, aboveground and underground services, health and safety aspects and the local way of life. Moreover, the final result of the decommissioning activity has residual effects of positive importance, particularly on the quality of the soil, health and safety, and visual quality as a result of the restoration of the former factory site. This project will also allow for the re-development of this site.

Table 8-2: Summary of the Analysis of the Anticipated Environmental Effects of the Decommissioning of the Former Pyrocel Factory Site/ Phases A, B and C

Source of effect		Effect			Environ. value	Degree of perturb.	Intensity/ effect	Duration/ effect	Duration/ intensity index	Extent of effect	Importance of effect	Mitigation measures. (See list in appendix 7)	Residual effect (importance)
Step	**Activity**	**Environ-ment**	**Environmental factor**	**Description**									
Demolition	Installation of the works	Human	Services	Interruption of energy, telephone and water distribution services due to the dismantling of the work site	High	High	High	Short	Medium	Limited	Not important	24, 25, 26	Negligible
	Demolition of the building and segregation of residual materials	Physical	Soil quality	Dust emitted during the demotion of the collapsed section of the building could contaminate the surface of the soil	High	Medium	High	Temporary	High	Limited	Not important	2, 9	Negligible
			Air quality	Demolition of the building will cause dust, sometimes contaminated, to be suspended in the air	High	Low	Average	Temporary	Medium	Limited	Not important	2, 11, 12	Negligible
			Ambient noise	The operation of the machinery, the demolition of the building and the handling of the materials will increase ambient noise levels	High	Medium	High	Temporary	High	Limited	Not important	12, 13, 14	Not important to negligible
		Human	Health and safety	Health risks to workers and neighbouring residents posed by exposure to dust emissions	Very high	Medium	High	Temporary to permanent	High	Limited	Not important	11, 27, 28. 31	Negligible

Table 8-2: Summary of the Analysis of the Anticipated Environmental Effects of the Decommissioning of the Former Pyrocel Factory Site/ Phases A, B and C (cont'd)

Source of effect		Effect			Environ. value	Degree of perturb.	Intensity/ effect	Duration/ effect	Duration/ intensity index	Extent of effect	Importance of effect	Mitigation measures. (See list in appendix 7)	Residual effect (importance)
Step	**Activity**	**Environment**	**Environmental factor**	**Description**									
	Evacuation and elimination of residual materials	Physical	Air quality	Handling debris and the operation of machines risk modifying air quality (dust and gas emissions)	High	Low	Average	Temporary	Medium	Limited	Not important	11, 12, 15	Negligible
			Ambient noise	Handling debris and the operation of machines and trucks will affect ambient noise levels	High	Medium	High	Temporary	High	Limited	Not important	12, 13, 14	Not important to negligible
Restor-ation	Excavation of contamin-ated soils	Physical	Ambient noise	Increased ambient noise levels linked to the operation of machinery and equipment	High	Medium	High	Temporary	High	Limited	Not important	12, 13, 14	Not important to negligible
		Human	Services	Excavation work may result in broken underground pipes	High	High	High	Temporary	High	Limited	Not important	24, 25, 26, 28	Not important to negligible
	Evacuation of contamin-ated soils	Physical	Ambient noise	Operation of trucks and machines will affect ambient noise levels	High	Medium	High	Temporary	High	Limited	Not important	12, 13, 14	Not important to negligible
	Dismantling and cleaning up the work site	Human	Services	Disconnecting the work site from local surfaces could cause temporary interruptions in service	High	High	High	Short	Medium	Limited	Not important	24, 25, 26, 28	Negligible

8.3 ENVIRONMENTAL INSPECTION

In order to ensure that the mitigation measures proposed in the environmental assessment are respected, the promoter intends to intervene in two ways.

First, by integrating provisions aimed at ensuring protection of the environment (including health) into the specifications of his call for tenders. Second, for the production phase of the work, by ensuring that the environmental clauses are integrated within the construction work monitoring plan.

With regard to the restoration activities, it is important to stress that the characterization techniques applied will have to comply with federal guidelines and guides, in particular the protocol of the *Canadian Recommendations for the Quality of Soils: Environment and Human Health* (CCME, 2001) and provincial guidelines such as the 1999 MENV Policy, (revised in 2000 and 2001). Moreover, the level of lead contamination remaining on the site must not exceed CCME (2001) recommendations for a site of a residential character. A soil characterization is planned at the end of the work in order to validate the level of contamination, and a visit will be made to the site to ensure that it is in good condition.

9 OTHER EFFECTS OF THE PROJECT

9.1 CUMULATIVE EFFECTS

No cumulative effects are entailed by the project for decommissioning the site of the former Pyrocel factory.

9.2 EFFECTS OF THE PROJECT ON THE SUSTAINABLE USE OF RENEWABLE RESOURCES

No renewable resource is likely to be affected by the project to any significant degree.

9.3 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

The environment also represents a potential source of impact on the project, particularly with regard to the accumulation of snow on the roof of the building. The building, in its current state, already has a collapsed roof over roughly half of its surface. This risk could be minimized, however, by the application of the mitigation measure requiring that the roof be cleared after each significant snowfall.

No other source of potential effect of the environment on the project has been identified.

9.4 EFFECTS OF POSSIBLE MALFUNCTIONS OR ACCIDENTS

The completion of the various activities and the application of certain mitigation measures may be hampered by malfunctions or accidents. Admittedly, several possible malfunctions and accidents are so minor as to have no major consequences. Malfunctions and accidents identified as having major consequences for the completion of the project and the environment are as follows:

- Emission of contaminated dust upon demolition of the building due to the tearing of the fabrics sealing the building
- Fire in the building due to arson or accidental causes
- Broken or malfunctioning protection equipment (torn safety suit and gloves, non-hermetic mask, etc.)
- Collapse of part of the roof during cleaning work
- Fall from the roof during snow clearance work on the roof of the building
- Collapse of the roof while clearing snow from the latter
- Accident between a transportation vehicle and a private vehicle.

Measures will be set in place to avoid such situations. Most of these malfunctions or accidents have little likelihood of occurring.

10 FOLLOWUP PROGRAM

At the end of the CEAA, a follow-up program is used both to check the appropriateness of the environmental assessment and to determine the effectiveness of the mitigation measures that were been taken. Since there is no uncertainty or ignorance on this topic and there are no significant negative or cumulative residual effects, no environmental follow-up program is envisaged.

11 CONCLUSION AND RECOMMENDATIONS BY THE RESPONSIBLE AUTHORITY

On the basis of the proposed mitigation measures, PWGSC agrees that the project, as described in this comprehensive study report, is not susceptible to cause important negative environmental effects. It still remains a preliminary conclusion that will have to be reconsidered following the analysis of the comments received during the public consultation period and following the announcement of the minister of Environment's decision.